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THE SIGNIFICANCE OF THE TREND TOWARDS THE FUNDAMENTALISATION OF HIGHER ENGINEERING EDUCATION

ЗНАЧУЩІСТЬ ТЕНДЕНЦІЇ ФУНДАМЕНТАЛІЗАЦІЇ ВИЩОЇ ІНЖЕНЕРНОЇ ОСВІТИ

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The fundamentalisation of higher education is a process of improving the quality of higher education by strengthening general education, which ensures the formation of basic, universal knowledge, skills, experience, values, etc. The importance of the basic sciences in the educational process of higher education is crucial in this process.

The tendency toward a fundamental shift in education has emerged in response to rapid and dramatic changes in society, such as the acceleration of scientific and technological progress, the complexity and development of production, informatization, and globalization. These changes have created a need to train not only highly specialized specialists, who risk losing competitiveness due to knowledge obsolescence, but also professionals with general theoretical, fundamental and interdisciplinary knowledge. It follows that “it is impossible to train a modern, lifelong learnerwithout fundamental education, mastering systemic knowledge, forming a holistic natural science and information picture of the world” [4, p. 13].

The analysis of scientific and pedagogical literature reveals the significant importance of the tendency towards the fundamentalization of higher education. For instance, S. O. Semerikov notes that “the fundamentalization of the education system is rightfully considered the most important direction of its

reform" [4, p. 20]. The orientation towards educational fundamentalization allows future professionals to acquire essential foundational knowledge during the learning process and to shape them "into a cohesive worldview scientific system based on modern concepts of science and its methods" [4, p. 20].

The importance of the fundamentalisation of higher education is confirmed by researcher V. Sadova, who says that "a specialist with fundamental knowledge and fundamental professional training not only directly determines the direction of development of society and technology, implementing the latest ideas, he is able to easily navigate the rapidly changing flow of scientific information, can restructure his activities based on the latest achievements" [3, p. 65].

A. Kolomiets also notes that "the fundamentalization of the general-professional training of future engineers is realized through the orientation towards students acquiring fundamental (basic) knowledge, which are system-forming, methodologically significant, reaching towards sources of understanding, towards original essences" [1, p. 1308].

The opinion of S. Reznik regarding the fact that "unlike narrowly specialized knowledge, which quickly becomes outdated, fundamental training ensures the necessary strength, substantiation, and demand for educational information, is valid. In the process of learning, the student must, first and foremost, assimilate the fundamental component of the educational content since such preparation serves as the foundation for studying all other subjects, for the formation of a comprehensive, systematic understanding of the surrounding world" [2, p. 17].

Researcher Y. Fruktova, addressing the issue of fundamentalization of the content of professional education, notes that "the avalanche-like growth of scientific information requires densification and fundamentalization of the educational material, raising its theoretical level, which contributes to ensuring the explanatory capacity of the acquired knowledge" [5, p. 311].

Thus, based on the conducted analysis, it can be noted that the fundamentalization of higher education contributes to

– formation of basic knowledge that doesn't become outdated as quickly as narrow-specialized ones;

– development of a scientific worldview;

– awareness of the directions of societal and technological development;

– providing a foundation for the study of other subjects;

– building a cohesive, systematic picture of the surrounding world;

– developing skills for self-education and self-learning.

The fundamentalization of education is a necessary prerequisite for elevating the quality of the professional preparation of future engineers. Foundational sciences foster essential qualities for the prospective professional endeavors of experts, such as logical reasoning, critical thinking

and creative capabilities. Logical reasoning empowers engineers to analyze intricate problems and devise effective solutions; critical thinking aids in evaluating information and making well-founded decisions, while creative abilities contribute to the generation of innovative ideas and solutions. Engineers possessing fundamental knowledge are adept at formulating groundbreaking technologies and developing new products and services, thereby fostering economic growth in the country.

Thus, based on the aforementioned points, it can be concluded that fundamental knowledge in contemporary higher technical education shapes the trajectory of future engineers, cultivating their understanding of a holistic model of the world and fostering critical thinking and comprehensive comprehension of the modern worldview. The trend of fundamentalization in higher engineering education is positive and contributes to enhancing the quality of engineers' training, their competitiveness in the global labor market, and the development of the domestic economy. For the further development of the trend of fundamentalization in higher engineering education, it is necessary to strengthen the role of general education in the educational process, promote the expansion of practical training for engineers, considering current trends in technological development, and integrate engineering disciplines with other fields of knowledge.

Bibliography:

1. Коломієць А. А. Фундаменталізація математичної підготовки майбутнього інженера як складова фундаменталізації освітнього процесу. *XLVII науково-технічна конференція підрозділів ВНТУ* : матеріали конференції, м. Вінниця, 14–23 березня 2018 р. [Електронний ресурс]. Вінниця, 2018. С. 1307–1310. URL: https://conferences.vntu.edu.ua/public/files/1/fitki_2018_netpub.pdf (дата звертання: 22.01.2024).

2. Резнік С. М. Формування управлінських умінь і навичок у майбутніх інженерів у вищих технічних навчальних закладах : дис. ... канд. пед. наук : 13.00.04. Харків, 2007. 271 с.

3. Садова В. В. Фундаменталізація змісту педагогічних дисциплін у підготовці майбутніх учителів початкової школи: теоретико-методологічні аспекти : монографія. Кривий Ріг : Вид. Р. А. Козлов, 2016. 392 с.

4. Семеріков С. О. Фундаменталізація навчання інформативних дисциплін у вищій школі : монографія. Київ : НПУ ім. М. П. Драгоманова, 2009. 340 с.

5. Фруктова Я. С. Фундаменталізація змісту професійної освіти як сучасна педагогічна проблема. *1025-річчя історії освіти в Україні: традиції, сучасність та перспективи:* матеріали міжнародної наукової конференції (м. Київ, 22.05.2014). Київ : Київський університет імені Бориса Грінченка, 2014. С. 310–316.